IN THE CLAIMS:

1. (cancelled)

2. (previously presented) A method of determining the optical characteristics of a dental object with an integrated system including a camera and a spectrophotometer, comprising the steps of:

generating an image of the dental object with the camera of the integrated system;

software processing the image of the dental object to determine a plurality of regions of the dental object that have different optical characteristics; and

generating optical characteristics data indicative of the optical characteristics of the dental object in one or more of the plurality of regions with the spectrophotometer of the integrated system.

3. (previously presented) The method of claim 2, wherein the method further comprises the step of calibrating the spectrophotometer by taking a measurement of a calibration standard.

4. (previously presented) The method of claim 2, wherein the spectrophotometer measures light returned from the dental object in a plurality of spectral bands.

5. (previously presented) The method of claim 2, wherein the integrated system operates with audio feedback, wherein the audio feedback guides a user's operation of the integrated system.

6. (previously presented) The method of claim 2, wherein the optical characteristics data are stored in a database, wherein the optical characteristics data are generated a plurality of times for a plurality of dental objects to generate a plurality of optical characteristics database records.

7. (previously presented) The method of claim 6, wherein the database records are associated with particular patients.

8. (previously presented) The method of claim 6, wherein the database records store pictures of the dental objects.

9. (previously presented) The method of claim 8, wherein the pictures of the dental objects comprise images of the dental objects captured with the camera.

10. (previously presented) The method of claim 6, wherein the optical characteristics data are generated a plurality of times for the dental object, wherein a database stores a historical record of the optical characteristics of the dental object.

11. (previously presented) The method of claim 2, wherein a second dental object is produced based on the optical characteristics data.

12. (previously presented) The method of claim 11, wherein optical characteristics of the second dental object are determined prior to installation of the second dental object in a patient's mouth.

13. (previously presented) The method of claim 12, wherein the optical characteristics of the second dental object are determined with the integrated system or a second integrated system.

14. (previously presented) The method of claim 12, wherein the optical characteristics of the second dental object are determined at a location where the second dental object is produced.

15. (previously presented) The method of claim 14, wherein the optical characteristics of the second dental object are determined with a second integrated system.

16. (previously presented) The method of claim 12, wherein the optical characteristics of the second dental object are determined at a location wherein the second dental object is to be installed in the patient's mouth.

17. (previously presented) The method of claim 16, wherein the optical characteristics of the second dental object are determined with the integrated system.

18. (previously presented) The method of claim 11, wherein the second dental object comprises a denture.

19. (previously presented) The method of claim 11, wherein the second dental object comprises a dental prosthesis.

20. (previously presented) The method of claim 11, wherein the second dental object comprises a filling.

21. (previously presented) The method of claim 11, wherein the second dental object comprises a tooth-colored filling.

22. (previously presented) The method of claim 11, wherein the second dental object comprises a composite filling.

23. (previously presented) The method of claim 11, wherein the second dental object is produced based on a porcelain recipe determined in accordance with the optical characteristics data.

24. (previously presented) The method of claim 2, wherein the optical characteristics data are electronically transmitted to a remote location, wherein a second object is produced at the remote location based on the transmitted optical characteristics data.

25. (previously presented) The method of claim 24, wherein the electronic transmission comprises a modem transmission.

26. (previously presented) The method of claim 24, wherein the electronic transmission includes a transmission of a picture of the dental object.

27. (previously presented) The method of claim 26, wherein the picture of the dental object comprises an image of the dental object captured with the camera.

28. (previously presented) The method of claim 2, wherein the optical characteristics data are stored in a database, wherein the database includes date and time information associated with the optical characteristics data.

29. (previously presented) The method of claim 2, wherein the optical characteristics data are stored in a database, wherein optical characteristics data indicative of the optical characteristics are generated a plurality of times, including at least once for a plurality of the regions.

30. (previously presented) The method of claim 29, wherein the database stores sectoring information with the optical characteristics data.

31. (previously presented) The method of claim 30, wherein the database stores information corresponding to a pictorial representation of the dental object that includes sector grid lines.

32. (previously presented) The method of claim 2, wherein a material mixing unit receives the optical characteristics data, wherein the material mixing unit prepares constituent materials for a second dental object based on the optical characteristics data.

33. (previously presented) The method of claim 2, wherein the camera comprises an intraoral camera.

34. (previously presented) The method of claim 2, wherein the camera comprises a video camera.

35. (previously presented) The method of claim 2, wherein the optical characteristics data is output in the form of a closest match or matches to one or a plurality of sets of stored shade guide values.

36. (previously presented) The method of claim 2, wherein a computing system stores data corresponding to a plurality of shade guide systems, each of the plurality of shade guide systems having a plurality of shade guide values, wherein the optical characteristics data is output in the form of a closest match or matches to one or more of the shade guide values in the plurality of shade guide systems.

37. (previously presented) The method of claim 36, wherein the optical characteristics data is output in the form of the closest match to one of the shade guide values in the plurality of shade guide systems.

38. (previously presented) The method of claim 2, wherein the optical characteristics data is used to electronically output a proposed recipe of materials for preparing a second dental object.

39. (previously presented) The method of claim 38, wherein the optical characteristics data is used to electronically output a proposed recipe of materials and instruction information for preparing a second dental object.

40. (previously presented) The method of claim 2, wherein the optical characteristics data is output in the form of one or more sets of color tri-stimulus values.

41. (previously presented) The method of claim 2, wherein an image of the dental object is displayed, wherein data indicative of the color of the dental object in one or more particular regions of the plurality of regions are displayed in an overlaid manner over the one or more particular regions.

42. (previously presented) A method of determining the optical characteristics of a dental object with an integrated system including a camera and a spectrophotometer, comprising the steps of:

generating an image of the dental object with the camera of the integrated system;

software processing the image of the dental object; and

generating optical characteristics data indicative of the optical characteristics of the dental object in one or more of regions of the dental object with the spectrophotometer of the integrated system.

43. (previously presented) The method of claim 42, wherein the method further comprises the step of calibrating the spectrophotometer by taking a measurement of a calibration standard.

44. (previously presented) The method of claim 42, wherein the spectrophotometer measures light returned from the dental object in a plurality of spectral bands.

45. (previously presented) The method of claim 42, wherein the integrated system operates with audio feedback, wherein the audio feedback guides a user's operation of the integrated system.

46. (previously presented) The method of claim 42, wherein the optical characteristics data are stored in a database, wherein the optical characteristics data are generated a plurality of times for a plurality of dental objects to generate a plurality of optical characteristics database records.

47. (previously presented) The method of claim 46, wherein the database records are associated with particular patients.

48. (previously presented) The method of claim 46, wherein the database records store pictures of the dental objects.

49. (previously presented) The method of claim 48, wherein the pictures of the dental objects comprise images of the dental objects captured with the camera.

50. (previously presented) The method of claim 46, wherein the optical characteristics data are generated a plurality of times for the dental object, wherein a database stores a historical record of the optical characteristics of the dental object.

51. (previously presented) The method of claim 42, wherein a second dental object is produced based on the optical characteristics data.

52. (previously presented) The method of claim 51, wherein optical characteristics of the second dental object are determined prior to installation of the second dental object in a patient's mouth.

53. (previously presented) The method of claim 52, wherein the optical characteristics of the second dental object are determined with the integrated system or a second integrated system.

54. (previously presented) The method of claim 52, wherein the optical characteristics of the second dental object are determined at a location where the second dental object is produced.

55. (previously presented) The method of claim 54, wherein the optical characteristics of the second dental object are determined with a second integrated system.

56. (previously presented) The method of claim 52, wherein the optical characteristics of the second dental object are determined at a location wherein the second dental object is to be installed in the patient's mouth.

57. (previously presented) The method of claim 56, wherein the optical characteristics of the second dental object are determined with the integrated system.

58. (previously presented) The method of claim 51, wherein the second dental object comprises a denture.

59. (previously presented) The method of claim 51, wherein the second dental object comprises a dental prosthesis.

60. (previously presented) The method of claim 51, wherein the second dental object comprises a filling.

61. (previously presented) The method of claim 51, wherein the second dental object comprises a tooth-colored filling.

62. (previously presented) The method of claim 51, wherein the second dental object comprises a composite filling.

63. (previously presented) The method of claim 51, wherein the second dental object is produced based on a porcelain recipe determined in accordance with the optical characteristics data.

64. (previously presented) The method of claim 42, wherein the optical characteristics data are electronically transmitted to a remote location, wherein a second object is produced at the remote location based on the transmitted optical characteristics data.

65. (previously presented) The method of claim 64, wherein the electronic transmission comprises a modem transmission.

66. (previously presented) The method of claim 64, wherein the electronic transmission includes a transmission of a picture of the dental object.

67. (previously presented) The method of claim 66, wherein the picture of the dental object comprises an image of the dental object captured with the camera.

68. (previously presented) The method of claim 42, wherein the optical characteristics data are stored in a database, wherein the database includes date and time information associated with the optical characteristics data.

69. (previously presented) The method of claim 42, wherein the optical characteristics data are stored in a database, wherein optical characteristics data indicative of the optical characteristics are generated a plurality of times, including at least once for a plurality of regions of the dental object.

70. (previously presented) The method of claim 69, wherein the database stores sectoring information with the optical characteristics data.

71. (previously presented) The method of claim 70, wherein the database stores information corresponding to a pictorial representation of the dental object that includes sector grid lines.

72. (previously presented) The method of claim 42, wherein a material mixing unit receives the optical characteristics data, wherein the material mixing unit prepares constituent materials for a second dental object based on the optical characteristics data.

73. (previously presented) The method of claim 42, wherein the camera comprises an intraoral camera.

74. (previously presented) The method of claim 42, wherein the camera comprises a video camera.

75. (previously presented) The method of claim 42, wherein the optical characteristics data is output in the form of a closest match or matches to one or a plurality of sets of stored shade guide values.

76. (previously presented) The method of claim 42, wherein a computing system stores data corresponding to a plurality of shade guide systems, each of the plurality of shade guide systems having a plurality of shade guide values, wherein the optical characteristics data is output

in the form of a closest match or matches to one or more of the shade guide values in the plurality of shade guide systems.

77. (previously presented) The method of claim 76, wherein the optical characteristics data is output in the form of the closest match to one of the shade guide values in the plurality of shade guide systems.

78. (previously presented) The method of claim 42, wherein the optical characteristics data is used to electronically output a proposed recipe of materials for preparing a second dental object.

79. (previously presented) The method of claim 78, wherein the optical characteristics data is used to electronically output a proposed recipe of materials and instruction information for preparing a second dental object.

80. (previously presented) The method of claim 42, wherein the optical characteristics data is output in the form of one or more sets of color tri-stimulus values.

81. (previously presented) The method of claim 42, wherein an image of the dental object is displayed, wherein data indicative of the color of the dental object in one or more particular regions of the dental object are displayed in an overlaid manner over the one or more particular regions.

82. (amended) ~~A method of determining the optical characteristics of a dental object with an apparatus that includes an imaging element, the method comprising the steps of:~~

~~generating an image of the dental object with the imaging element;~~

~~software processing the image of the dental object; and~~

~~generating optical characteristics data indicative of the optical characteristics of the dental object;~~

~~wherein, under software control a determination is made of a plurality of regions of the dental object that have different optical characteristics;~~

~~wherein optical characteristics data are generated in one or more of the plurality of regions.~~

A method of determining the optical characteristics of a dental object with an apparatus that includes an imaging element and a spectrometer apparatus, the method comprising the steps of:

generating an image of the dental object with the imaging element; and

generating optical characteristics data indicative of optical characteristics of the dental object including at least color characteristics with the spectrometer apparatus;

wherein, under software control a determination is made of a plurality of regions of the dental object having different color characteristics;

wherein optical characteristics of the dental object including at least color characteristics are determined in the plurality of regions based on the spectrometer data generated with the spectrometer apparatus.

83. (previously presented) The method of claim 82, wherein the method further comprises the step of generating optical characteristics data of a color reference standard, wherein the optical characteristics data are generated based on optical characteristics data of the color reference standard.

84. (previously presented) The method of claim 82, wherein a spectrometer measures light returned from the dental object in a plurality of spectral bands.

85. (previously presented) The method of claim 82, wherein audio feedback is generated, wherein the audio feedback guides a user's operation of the apparatus.

86. (previously presented) The method of claim 82, wherein the optical characteristics data are stored in a database, wherein the optical characteristics data are generated a plurality of times for a plurality of dental objects to generate a plurality of optical characteristics database records.

87. (previously presented) The method of claim 86, wherein the database records are associated with particular patients.

88. (previously presented) The method of claim 86, wherein the database records store images representative of the dental objects.

89. (previously presented) The method of claim 88, wherein the images representative of the dental objects comprise images of the dental objects captured with the camera.

90. (previously presented) The method of claim 86, wherein the optical characteristics data are generated a plurality of times for the dental object, wherein a database stores a historical record of the optical characteristics of the dental object.

91. (previously presented) The method of claim 82, wherein a second dental object is produced based on the optical characteristics data.

92. (previously presented) The method of claim 91, wherein optical characteristics of the second dental object are determined prior to installation of the second dental object in a patient's mouth.

93. (previously presented) The method of claim 92, wherein the optical characteristics of the second dental object are determined with the apparatus or a second apparatus.

94. (previously presented) The method of claim 92, wherein the optical characteristics of the second dental object are determined at a location where the second dental object is produced.

95. (previously presented) The method of claim 94, wherein the optical characteristics of the second dental object are determined with a second apparatus.

96. (previously presented) The method of claim 92, wherein the optical characteristics of the second dental object are determined at a location wherein the second dental object is to be installed in the patient's mouth.

97. (previously presented) The method of claim 96, wherein the optical characteristics of the second dental object are determined with the apparatus.

98. (previously presented) The method of claim 91, wherein the second dental object comprises a denture.

99. (previously presented) The method of claim 91, wherein the second dental object comprises a dental prosthesis.

100. (previously presented) The method of claim 91, wherein the second dental object comprises a filling.

101. (previously presented) The method of claim 91, wherein the second dental object comprises a tooth-colored filling.

102. (previously presented) The method of claim 91, wherein the second dental object comprises a composite filling.

103. (previously presented) The method of claim 91, wherein the second dental object is produced based on a porcelain recipe determined in accordance with the optical characteristics data.

104. (previously presented) The method of claim 82, wherein the optical characteristics data are electronically transmitted to a remote location, wherein a second object is produced at the remote location based on the transmitted optical characteristics data.

105. (previously presented) The method of claim 104, wherein the electronic transmission comprises a modem transmission.

106. (previously presented) The method of claim 104, wherein the electronic transmission includes a transmission of an image representative of the dental object.

107. (previously presented) The method of claim 106, wherein the image representative of the dental object comprises an image of the dental object captured with the camera.

108. (previously presented) The method of claim 82, wherein the optical characteristics data are stored in a database, wherein the database includes date and time information associated with the optical characteristics data.

109. (previously presented) The method of claim 82, wherein the optical characteristics data are stored in a database, wherein optical characteristics data indicative of the optical characteristics are generated a plurality of times, including at least once for a plurality of the regions.

110. (previously presented) The method of claim 109, wherein the database stores sectoring information with the optical characteristics data.

111. (previously presented) The method of claim 110, wherein the database stores information corresponding to a pictorial representation of the dental object that includes sector grid lines.

112. (previously presented) The method of claim 82, wherein a material mixing unit receives the optical characteristics data, wherein the material mixing unit prepares constituent materials for a second dental object based on the optical characteristics data.

113. (previously presented) The method of claim 82, wherein the imaging element comprises an intraoral camera.

114. (previously presented) The method of claim 82, wherein the imaging element comprises a video camera.

115. (previously presented) The method of claim 82, wherein the optical characteristics data is output in the form of a closest match or matches to one or a plurality of sets of stored shade guide values.

116. (previously presented) The method of claim 82, wherein a computing system stores data corresponding to a plurality of shade guide systems, each of the plurality of shade guide systems having a plurality of shade guide values, wherein the optical characteristics data is output in the form of a closest match or matches to one or more of the shade guide values in the plurality of shade guide systems.

117. (previously presented) The method of claim 116, wherein the optical characteristics data is output in the form of the closest match to one of the shade guide values in the plurality of shade guide systems.

118. (previously presented) The method of claim 82, wherein the optical characteristics data is used to electronically output a proposed recipe of materials for preparing a second dental object.

119. (previously presented) The method of claim 118, wherein the optical characteristics data is used to electronically output a proposed recipe of materials and instruction information for preparing a second dental object.

120. (previously presented) The method of claim 82, wherein the optical characteristics data is output in the form of one or more sets of color tri-stimulus values.

121. (previously presented) The method of claim 82, wherein an image of the dental object is displayed, wherein data indicative of the color of the dental object in one or more particular regions of the plurality of regions are displayed in an overlaid manner over the one or more particular regions.